



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN THE MATTER OF THE APPLICATION FOR PATENT

INVENTOR: Masaaki HARASAWA et al. | DOCKET NO.: 4293

APPLICATION NO.: 10/017,983 | CONFIRM. NO.: 8381

FILING DATE: December 13, 2001 | ART UNIT: 2839

TITLE OF INVENTION: | EXAMINER: M. C. Zarroli
Electric Connector for
Electrically Connecting a Wire
of one Article to a Contact of
Another Article

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June 15, 2006

SUBMITTAL OF CORRECTED ENGLISH TRANSLATION OF PRIORITY DOCUMENT


Dear Sir:

- 1) This application claims the foreign priority of Japanese Patent Application 2000-384528. In order to perfect and assert the foreign priority claim, an English translation of the Japanese Priority Application 2000-384528 was enclosed with the Response of September 15, 2003 in this US application. It has now been discovered that the previously filed English translation of the Japanese Priority Application includes some minor inadvertent translation and clerical errors.
- 2) In view of the above, in order to correct the English translation that was filed on September 15, 2003, we are now enclosing:
 - a) a new "Certificate of Translator" certifying that the appended corrected pages represent an accurate English translation of the Japanese Patent Application 2000-384528;
 - b) a clean version of corrected pages 5, 7, 9, 11, 14, 16, 17, 19 and 21 of the previous English translation that was filed on September 15, 2003; and

- c) a hand-corrected marked-up version of pages 5, 7, 9, 11, 14, 16, 17, 19 and 21 of the previous English translation, showing the necessary corrections that are incorporated in the clean version.
- 3) From a review of the enclosed hand-corrected marked-up version of the replacement pages, it will be apparent that the errors are merely minor clerical and translation errors. The corrections are clearly supported by the context of the corrected text passages, and the remaining context. For example, referring to the middle of page 9, the remaining text clearly discloses that the guide protrusion 213 extends in the depth direction rather than the width direction, that reference number 213 refers to the guide protrusion rather than a guide groove, and that the fitting groove 114 is formed in the height direction. The further corrections are similarly self-explanatory.
- 4) Entry of the enclosed Certificate of Translator and the appended corrected translation pages are respectfully requested, to correct the English translation of the Priority Document previously filed herein on September 15, 2003.

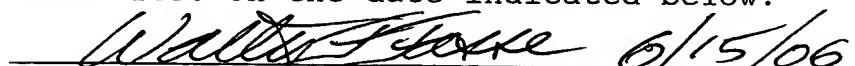
Respectfully submitted,
Masaaki HARASAWA et al.
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WFF:ks/4293
Enclosures:
a) to c)

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CERTIFICATE OF MAILING:

I hereby certify that this correspondence with all indicated enclosures is being deposited with the U. S. Postal Service with sufficient postage as first-class mail, in an envelope addressed to: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450 on the date indicated below.

 6/15/06
Name: Walter F. Fasse - Date: June 15, 2006



4293
10/017,983

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Inventors: Masaaki Harasawa, Saburou Kase and Satoru Kihira

Serial No.: 10/017,983

Filing Date: December 13, 2001

For: Electric Connector

CERTIFICATE OF TRANSLATOR

Sir:

I, Tomoaki Nunami, residing at 2-9, Shinoharahonmachi 1-chome, Nada-ku,

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Kobe-shi, Hyogo 657-0067 Japan, hereby certify that my hereto appended

English translation (pages 5,7,9,11,14,16,17,19 and 21) of Japanese Patent

Application 2000-384528 is accurate.

Date June 7, 2006

(signature)

fitting-in.

【 0 0 0 9 】

With this arrangement, when the electric connector is fitted into the concaved part of the article, the electric connector will be fitted onto the article. Hence the workability of fitting is good.

【 0 0 1 0 】

An electric connector of claim 3 is the electric connector as recited in claims 1 or 2, wherein the housing is formed in such a way that it can be inserted into a concaved part formed in an article, the housing is provided with a wing, which is elastically deformed to press the longitudinal wall of the concaved part when the housing is inserted into the concaved part, and the housing is fitted onto the article by the pressure of the wing.

【 0 0 1 1 】

With this arrangement, a high fitting force is provided by a simple structure. Moreover, as the dimensional errors in the inside dimensions of the concaved part are absorbed by the flexion of the wing, the yields of the article and the electric connector are improved.

【 0 0 1 2 】

An electric connector of claim 4 is the electric connector as recited in any of claim 1 through claim 3 wherein the housing is provided with a locking pawl and the housing is fitted onto an article by fitting the locking pawl onto the article.

【 0 0 1 3 】

With this arrangement, a high fitting force is obtained by a simple structure.

【 0 0 1 4 】

An electric connector of claim 5 is the electric connector as recited in any of

parallelepiped. For convenience, a direction along one side of the housing 110 is defined as the longitudinal direction, and a direction that goes approximately direct to that direction is defined as the width direction. A direction that goes approximately direct to both the longitudinal direction and the width direction is defined as the height direction. Inside the housing 110, cavities 111 being cells for storing contacts 120 are formed in the longitudinal direction. The cavities 111 as many as the contacts 120 are formed in a row in the width direction. One end, in the longitudinal direction, of each cavity 111 is opened as an insertion port 112 in one face, in the longitudinal direction, of the housing 110. Each contact 120 is to be inserted through this insertion port 112. A contact window 113 is opened through to each cavity 111 in one face, in the height direction, of the housing 110. A contacting part of the contact 120, which will be described later, is exposed through this contact window 113 to come out of the face of the housing 110. This contact window 113 is formed through to the above-mentioned insertion port 112 so that the contact 120 can be easily inserted into the cavity 111. The housing according to the present invention is not limited to the form of the approximate rectangular parallelepiped. It may be any form, which can be fitted onto the articles and into which the contacts can be assembled.

【 0 0 1 8 】

As shown in Fig. 5, the above-mentioned contact 120 is made of a member that has electric conductivity, and the contact 120 comprises a connecting part 121, which is connected to the conductive part 211 of the first article 210, and a contacting part 122, which contacts the conductive part 221 of the second article 220 with a pressing force. Here, it is exemplified by a crimp type contact 120. Hence the connecting part 121 is a barrel formed at one end of the contact 120, and

concaved part that is formed in the article. In the case of the connecting form shown in Fig. 1 through Fig. 3, the housing 110 is fitted onto the first article 210. To the end, a groove-shaped concaved part 212 is formed in the first article 210, and the width of the housing 110 is made to have a dimension that can fit into this concaved part 212. The electric connector 100 is fitted into this concaved part 212 in such a way that the height direction of the electric connector 100 aligns with the depth direction of the concaved part 212 and the contacting part 122 comes out of the concaved part 212. On each of the two longitudinal walls 212a of this concaved part 212, which are opposing to each other, a guide protrusion 213 is formed to extend in the depth direction. In each of both the external walls 116, in the width direction, of the housing 110, a fitting groove 114, into which the above-mentioned guide protrusion 213 fits, is formed in the height direction. The fitting grooves 114 and the guide protrusions 213 fit together with a certain pressure, and the housing 110 is fitted onto the first article 210 by this fitting (the state shown in Fig. 1 and Fig. 2). Here, fitting grooves 114 are formed in the electric connector 100 and guide protrusions 213 are formed on the concaved part 212. However, in contrast with this, guide protrusions may be formed on the electric connector and fitting grooves may be formed in the concaved part. Here, the concaved part 212 is groove-shaped, but the concaved part may have any form provided that it can store the electric connector. Moreover, instead of providing fitting grooves and guide protrusions, the external walls of the housing may be made to face-contact the longitudinal walls of the concaved part and the housing may be fitted onto the first article by this fitting. These comments also apply to the concaved parts 212, 225, which will be described in relation to the connecting forms that will be described below.

【 0 0 2 0 】

fitting grooves 114 and the guide protrusions 226 fit together with a certain pressure, and the housing 110 is fitted onto the second article 220 by this fitting.

【 0 0 2 2 】

In the case of this connecting form, when the connecting part 121 of the contact 120 of the electric connector 100 is connected to the conductive part 211 of the first article 210, and the housing 110 is fitted onto the second article 220, the contacting part 122 of the contact 120 will contact the conductive part 221 of the second article 220 with a pressing force, and the conductive parts 211, 221 of both the articles 210, 220 will be electrically connected by the contact 120.

【 0 0 2 3 】

Fig. 8 shows another connecting form of the electric connector 100 of the above-mentioned first embodiment. In this case, the housing 110 is fitted onto the first article 210 and the second article 220. To this end, a groove-shaped concaved part 212 is formed in the first article 210, and a groove-shaped concaved part 225 is formed in the second article 220, respectively, and the width of the housing 110 is made to have a dimension that can be fitted into both the concaved parts 212, 225. The conductive part 221 of the second article 220 is provided on the bottom of the concaved part 225. The electric connector 100 is fitted into the concaved part 212 in such a way that the height direction of the electric connector 100 aligns with the depth direction of the concaved part 212 and the contacting part 122 comes out of the concaved part 212, and the electric connector 100 is fitted into the concaved part 225 in such a way that the height direction of the electric connector 100 aligns with the depth direction of the concaved part 225 and the contacting part 122 opposes to the bottom of the concaved part 225. Guide protrusions 213, 226 are formed on the concaved parts 212, 225, and the fitting

Fig. 9 and Fig. 10 show the electric connector 100 of the second embodiment. The housing 110 of the electric connector 100 of this second embodiment is formed in such a way that it can be inserted into a concaved part formed in an article and is provided with wings 117, which are elastically deformed to press against the longitudinal walls of a concaved part when the housing 110 is inserted into the concaved part. The housing 110 is fitted onto the article by the pressures of the wings 117. In this embodiment, a wing 117 is provided on each of two outside walls 116 on both ends, in the width direction, of the housing 110. In the case of the connecting form shown in Fig. 9 and Fig. 10, the housing 110 is fitted onto the first article 210. To this end, a concaved part 212 is formed in the first article 210 and the housing 110 is formed in such a way that it can be inserted into the concaved part 212, and the housing 110 is provided with wings 117, which are elastically deformed to press against the longitudinal walls 212a of the concaved part 212 when the housing 110 is inserted into the concaved part 212. The electric connector 100 is fitted into this concaved part 212 in such a way that the height direction of the electric connector 100 aligns with the depth direction of the concaved part 212 and the contacting part 122 comes out of the concaved part 212. The method of electrically connecting the articles 210, 220 with the electric connector 100 in this connecting form is similar to that of the connecting form shown in Fig. 1 through Fig. 3.

【 0 0 3 0 】

Fig. 11 shows another connecting form of the electric connector 100 of the above-mentioned second embodiment. In the case of this connecting form, the housing 110 is fitted onto the second article 220. To this end, a concaved part 225 is formed in the second article 220, and the housing 110 is formed in such a way

pawls 118 extend on both ends, in the width direction, of the housing 110 in the direction of height. A hook 118a, facing in the width direction, is provided on the top end of each locking pawl 118, and this hook 118a enters a locking hole formed in an article and hooks on the edge of the locking hole. In the case of the connecting form shown in Fig. 13, the housing 110 is fitted onto the second article 220. To this end, locking holes 222 are formed in the second article 220, and the locking pawls 118 extend protrusively from the face of the housing 110, on which the contacting parts 122 are exposed. The electric connector 100 is held in such a way that the contacting parts 122 oppose to the conductive parts 221 of the second article 220, and the locking pawls 118 are fitted on the second article 220. The method of electrically connecting the articles 210, 220 with the electric connector 100 in this connecting form is similar to that of the connecting form shown in Fig. 6 and Fig. 7.

【 0 0 3 3 】

Fig. 14 shows another connecting form of the electric connector 100 of the above-mentioned third embodiment. In the case of this connecting form, the housing 110 is fitted onto the first article 210. To this end, locking holes 215 are formed in the first article 210, and the locking pawls 118 extend protrusively from the face of the housing 110, which is opposite, in the height direction, to the face on which the contacting parts 122 are exposed. The electric connector 100 is held in such a way that the face being opposite, in the height direction, to the contacting parts 122 opposes to the first article 210, and the locking pawls 118 are fitted onto the first article 210. The method of electrically connecting the articles 210, 220 with the electric connector 100 in this connecting form is similar to that of the connecting form shown in Fig. 1 through Fig. 3.

【 0 0 3 4 】

The third embodiment in each connecting form exhibits operation and effect similar to those of the first embodiment, and high fitting force is provided by a simple structure. When the locking pawls 118 are provided on both ends, in the width direction, of the housing 110, the fitting forces of the locking pawls 118 will work on both ends, in the width direction, of the housing 110, and, in turn, the electric connector 100 will be held stably on both the articles 210, 220 after fitting, and this is preferable.

【 0 0 3 5 】

The present invention includes all embodiments wherein features of the embodiments described above are combined. The fitting forms of the first embodiment, the fitting forms of the second embodiment, and the fitting forms of the third embodiment can be combined in the fitting form of fitting one housing 110 onto both the first article 210 and the second article 220, and the present invention includes all of these embodiments. One example shown in Fig. 15 is an embodiment wherein one housing 110 is fitted onto the first article 210 by the fitting form of the first embodiment and onto the second article 220 by the fitting form of the third embodiment. In the case of this embodiment, as shown in Fig. 12, when necessary, a fitting groove 114 is provided in the outside face of each locking pawl 118 and guide protrusions 213 are provided on the first article 210. In this way, the fitting-in force between the housing 110 and the concaved part 212 can be increased. When this form of fitting one housing 110 onto both the first article 210 and the second article 220 is used, as explained in relation to the first embodiment, in addition to the operation and effect that are obtained by the form of fitting one housing 110 onto the first article 210 or the second article 220, the two articles 210, 220 are joined together by the electric connector 100. Hence there will be no

first article and the contact is made to contact the conductive pad to make the electrical connection.

【 0 0 3 9 】

【 Effects of the invention 】

The electric connector of claim 1 ensures a contact pressure at the contacting point and make a reliable electric connection between the articles, reduces the number of electric connector in use and improves the workability, and in turn, achieves significant cost reduction and compactification of the connecting structure. When the housing is fitted onto both the first article and the second article, costs can be reduced through elimination of a joining means.

【 0 0 4 0 】

With the arrangement of the claim 2, when the electric connector is fitted into the concaved part of the article, the electric connector will be fitted onto the article. Hence the workability of fitting is good.

【 0 0 4 1 】

With the arrangement of the claim 3, a high fitting force is provided by a simple structure. Moreover, as the dimensional errors in the inside dimensions of the concaved part are absorbed by the flexion of the wing, the yields of the article and the electric connector are improved.

【 0 0 4 2 】

With the arrangement of the claim 4, a high fitting force is obtained by a simple structure.

【 0 0 4 3 】

With the arrangement of the claim 5, when the conductive part of the first article is an electric wire, the connection between the connecting part of the

This is a sectional view of the electric connector of the first embodiment when it is used by fitting it onto both the first article and the second article.

【Fig. 9】

This is a perspective view of the electric connector of the second embodiment when it is fitted onto the first article.

【Fig. 10】

This is a front view of the electric connector of the second embodiment when it is used by fitting it onto the first article.

【Fig. 11】

This is a perspective view of the electric connector of the second embodiment when it is fitted onto the second article.

【Fig. 12】

This is a perspective view of the electric connector of the third embodiment.

【Fig. 13】

This is a front view of the electric connector of the third embodiment when it is used by fitting it onto the second article.

【Fig. 14】

This is a front view of the electric connector of the third embodiment when it is used by fitting it onto the first article.

【Fig. 15】

This is a front view of the electric connector of the third embodiment when it is used by fitting it onto both the first article and the second article.

【Fig. 16】

This is a perspective view of the disassembled electric connector of the fourth embodiment.